CLAIMS

WHAT IS CLAIMED:

1. A method for contemporaneously utilizing seismic data in the pre-stack seismic domain and the post-stack seismic domain, comprising:

      initiating a higher order probe at a three-dimensional coordinate in a post-stack seismic volume; and

instantiating a pre-stack seismic data content for the higher order probe.

2. The method of claim 1, wherein initiating the higher order probe from the three-dimensional coordinate includes initiating the higher order probe at a trace location in the post-stack seismic volume.

3. The method of claim 2, wherein the trace location comprises a binning location.

4. The method of claim 3, wherein the binning location comprises one of a common midpoint location, a common conversion point location or a common image point location

5. The method of claim 2, wherein the trace location comprises a seismic navigation location.

6. The method of claim 5, wherein the seismic navigation comprises one of a common receiver location or a common shot location.

7. The method of claim 1, wherein initiating the higher order probe from the three-dimensional coordinate includes initiating the higher order probe at a velocity analysis location in the post-stack seismic volume.

8. The method of claim 1, wherein initiating the higher order probe at the velocity analysis location includes initiating the higher order probe at a velocity update location in the post-stack seismic volume.

9. The method of claim 7, wherein initiating the higher order probe at the velocity analysis location includes providing a map of analysis locations.

10. The method of claim 7, wherein the analysis location comprises one of a common midpoint location, a common conversion point and a common image point location.

1   11.   The method of claim 7, wherein the velocity analysis location includes a *Vp*, a *Vs* or a

2   *Vp/Vs* velocity analysis location.

1   12.   The method of claim 1, wherein initiating the higher order probe from the three-

2   dimensional coordinate includes selecting a type for the higher order probe.

1   13.   The method of claim 12, selecting the type for the higher order probe comprises

2   selecting one of a *common midpoint gather, a common conversion point gather, a common*

3   *image point gather, a common shot gather, a common receiver gather, a semblance panel, a*

4   *gamma scan and a focusing panel.*

1   14.   The method of claim 1, wherein initiating the higher order probe from the three-

2   dimensional coordinate includes setting a multi-dimensional frame.

1   15.   The method of claim 14, wherein setting the multi-dimensional frame includes

2   graphically setting the multi-dimensional frame.

1   16.   The method of claim 14, wherein setting the multi-dimensional frame includes setting

2   at least one of time window, depth window, offset/velocity range, offset/velocity scale, trace

3   decimation, azimuths, and azimuth artificial reorientation.

1   17.   The method of claim 1, wherein instantiating the higher order probe at the three-

2   *dimensional coordinate includes attaching the collective higher order probe to the three-*

3   dimensional reference system.

1   18.   The method of claim 17, further comprising:

2   rotating, translating or zooming in or out the scene; and

3   rotating, translating or zooming in or out the higher order probe with the scene.

1   19.   The method of claim 1, wherein instantiating the higher order probe at the three-

2   dimensional coordinate includes detaching the higher order probe from the three-dimensional

3   reference system.

1   20.   The method of claim 19, further comprising manipulating the detached higher order

2   probe.

1   21.   The method of claim 20, wherein manipulating the detached higher order probe
2   includes at least one of rotation, translation, rescaling, slicing, and setting visual attributes.

1   22.   The method of claim 1, further comprising:
2   initiating at least one secondary higher order probe at secondary three-dimensional
3   coordinates in the post-stack seismic volume; and
4   instantiating the secondary pre-stack seismic data content for the secondary higher
5   order probe.

1   23.   The method of claim 22, wherein initiating the second higher order probe includes
2   initiating a higher order probe independent of the first higher order probe.

1   24.   The method of claim 22, wherein the first and secondary higher order probes
2   comprise a collective probe.

1   25.   The method of claim 22, wherein initiating the second higher order probe includes
2   initiating a higher order probe dependent on the first higher order probe.

1   26.   The method of claim 1, further comprising:
2   slicing through the post-stack seismic domain; and
3   automatically instantiating the higher order probe on each slice while slicing through
4   the post-stack seismic domain.

1   27.   The method of claim 1, further comprising:
2   seeding with interpretation at least one of the pre-stack seismic domain and the post-
3   stack seismic domain; and
4   spreading the interpretation in the other domain.

1   28.   A program storage medium encoded with instructions that, when executed by a
2   computer, perform a method for contemporaneously utilizing seismic data in the pre-stack
3   seismic domain and the post-stack seismic domain, the method comprising:
4   initiating a higher order probe at a three-dimensional coordinate in a post-stack
5   seismic volume; and
6   instantiating a pre-stack seismic data content for the higher order probe.

1   29.   The program storage medium of claim 28, wherein initiating the higher order probe
2   from the three-dimensional coordinate in the encoded method includes initiating the higher
3   order probe at a trace location in the post-stack seismic volume.

1   30.   The program storage medium of claim 28, wherein initiating the higher order probe
2   from the three-dimensional coordinate in the encoded method includes initiating the higher
3   order probe at a velocity analysis location in the post-stack seismic volume.

1   31.   The program storage medium of claim 28, wherein initiating the higher order probe
2   from the three-dimensional coordinate in the encoded method includes selecting a type for
3   the higher order probe.

1   32.   The program storage medium of claim 28, wherein initiating the higher order probe
2   from the three-dimensional coordinate in the encoded method includes setting a multi-
3   dimensional frame.

1   33.   The program storage medium of claim 28, wherein instantiating the higher order
2   probe at the three-dimensional coordinate in the encoded method includes attaching the
3   collective higher order probe to the three-dimensional reference system.

1   34.   The program storage medium of claim 28, wherein instantiating the higher order
2   probe at the three-dimensional coordinate in the encoded method includes detaching the
3   higher order probe from the three-dimensional reference system.

1   35.   The program storage medium of claim 28, wherein the encoded method further
2   comprises:
3   initiating at least one secondary higher order probe at secondary three-dimensional
4   coordinates in the post-stack seismic volume; and
5   instantiating the secondary pre-stack seismic data content for the secondary higher
6   order probe.

1   36.   The program storage medium of claim 28, wherein the encoded method further
2   comprises:
3   slicing through the post-stack seismic domain; and
4   automatically instantiating the higher order probe on each slice while slicing throught
5   the post-stack seismic domain.

1   37.   The program storage medium of claim 28, wherein the encoded method further

2   comprises:

3   seeding with interpretation at least one of the pre-stack seismic domain and the post-

4   stack seismic domain; and

5   spreading the interpretation in the other domain.

1   38.   A computer programmed to perform a method for contemporaneously utilizing

2   seismic data in the pre-stack seismic domain and the post-stack seismic domain, the method

3   comprising:

4   initiating a higher order probe at a three-dimensional coordinate in a post-stack

5   seismic volume; and

6   instantiating a pre-stack seismic data content for the higher order probe.

1   39.   The computer of claim 38, wherein initiating the higher order probe from the three-

2   dimensional coordinate in the programmed method includes initiating the higher order probe

3   at a trace location in the post-stack seismic volume.

1   40.   The computer of claim 38, wherein initiating the higher order probe from the three-

2   dimensional coordinate in the programmed method includes initiating the higher order probe

3   at a velocity analysis location in the post-stack seismic volume.

1   41.   The computer of claim 38, wherein initiating the higher order probe from the three-

2   dimensional coordinate in the programmed method includes selecting a type for the higher

3   order probe.

1   42.   The computer of claim 38, wherein initiating the higher order probe from the three-

2   dimensional coordinate in the programmed method includes setting a multi-dimensional

3   frame.

1   43.   The computer of claim 38, wherein instantiating the higher order probe at the three-

2   dimensional coordinate in the programmed method includes attaching the collective higher

3   order probe to the three-dimensional reference system.

1   44.   The computer of claim 38, wherein instantiating the higher order probe at the three-

2   dimensional coordinate in the programmed method includes detaching the higher order probe

3   from the three-dimensional reference system.

1   45.   The computer of claim 38, in the programmed method further comprises:

2   initiating at least one secondary higher order probe at secondary three-dimensional

3   coordinates in the post-stack seismic volume; and

4   instantiating the secondary pre-stack seismic data content for the secondary higher

5   order probe.

1   46.   The computer of claim 38, in the programmed method further comprises:

2   slicing through the post-stack seismic domain; and

3   automatically instantiating the higher order probe on each slice while slicing through

4   the post-stack seismic domain.

1   47.   The computer of claim 38, wherein the programmed method further comprises:

2   seeding with interpretation at least one of the pre-stack seismic domain and the post-

3   stack seismic domain; and

4   spreading the interpretation in the other domain.

1   48.   A method for contemporaneously navigating seismic data in the pre-stack seismic

2   domain and the post-stack seismic domain, comprising:

3   initiating a collective higher order probe at a plurality of three-dimensional

4   coordinates in the post-stack seismic volume;

5   instantiating a pre-stack seismic data content for the collective higher order probe;

6   slicing through the post-stack seismic domain; and

7   automatically instantiating the collective higher order probe on each slice while

8   slicing through the post-stack seismic domain.

1   49.   The method of claim 48, wherein initiating the collective higher order probe from the

2   three-dimensional coordinates includes initiating the collective higher order probe at a

3   plurality of trace locations in the post-stack seismic volume.

1   50.   The method of claim 48, wherein initiating the collective higher order probe from the

2   three-dimensional coordinates includes initiating the collective higher order probe at a

3   plurality of velocity analysis locations in the post-stack seismic volume.

1   51.   The method of claim 48, wherein initiating the collective higher order probe at the
2   velocity analysis locations includes initiating the collective higher order probe at a plurality
3   of velocity update locations in the post-stack seismic volume.

1   52.   The method of claim 48, wherein initiating the collective higher order probe from the
2   three-dimensional coordinates includes selecting a type for the collective higher order probe.

1   53.   The method of claim 48, wherein instantiating the collective higher order probe at the
2   three-dimensional coordinates includes attaching the collective higher order probe to the
3   three-dimensional reference system.

1   54.   The method of claim 48, wherein instantiating the collective higher order probe at the
2   three-dimensional coordinates includes detaching the collective higher order probe from the
3   three-dimensional reference system.

1   55.   A method for contemporaneously interpreting seismic data in the pre-stack seismic
2   domain and the post-stack seismic domain, comprising:
3   initiating a higher order probe at a three-dimensional coordinate in a post-stack
4   seismic volume;
5   instantiating a pre-stack seismic data content for the higher order probe; and
6   seeding at least one of the pre-stack seismic domain and the post-stack seismic
7   domain from the other.

1   56.   The method of claim 55, wherein initiating the higher order probe from the three-
2   dimensional coordinate includes initiating the higher order probe at a trace location in the
3   post-stack seismic volume.

1   57.   The method of claim 55, wherein initiating the higher order probe from the three-
2   dimensional coordinate includes initiating the higher order probe at a velocity analysis
3   location in the post-stack seismic volume.

1   58.   The method of claim 55, wherein initiating the higher order probe at the velocity
2   analysis location includes initiating the higher order probe at a velocity update location in the
3   post-stack seismic volume.

1 59. The method of claim 55, wherein initiating the higher order probe from the three-
2 dimensional coordinate includes selecting a type for the higher order probe.

1 60. The method of claim 55, wherein initiating the higher order probe from the three-
2 dimensional coordinate includes setting a multi-dimensional frame.

1 61. The method of claim 55, wherein instantiating the higher order probe at the three-
2 dimensional coordinate includes attaching the collective higher order probe to the three-
3 dimensional reference system.

1 62. The method of claim 55, wherein instantiating the higher order probe at the three-
2 dimensional coordinate includes detaching the higher order probe from the three-dimensional
3 reference system.

1 63. The method of claim 55, further comprising:
2 initiating at least one secondary higher order probe at a secondary three-dimensional
3 coordinates in the post-stack seismic volume; and
4 instantiating the secondary pre-stack seismic data content for the secondary higher
5 order probe.

1 64. The method of claim 55, further comprising:
2 slicing through the post-stack seismic domain; and
3 automatically instantiating the higher order probe on each slice while slicing through
4 the post-stack seismic domain.